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NUMBER 6

THE AGRICULTURAL STUDENT

A MONTHLY MAGAZINE DEVOTED TO AGRICULTURAL EDUCATION

HORTICULTURAL NUMBER



MARCH, 1910

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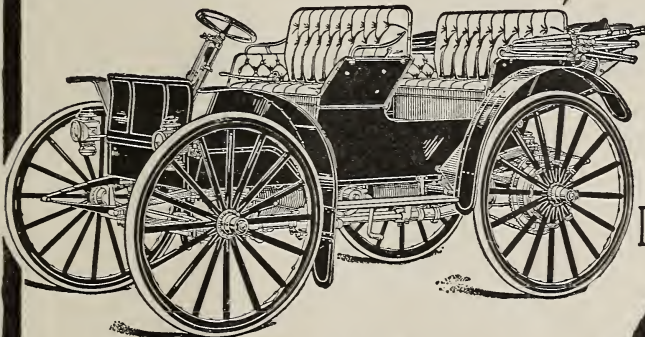
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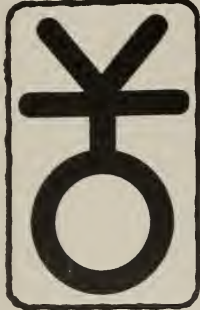
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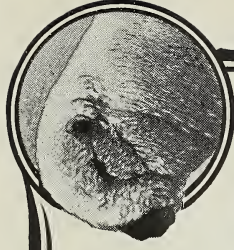
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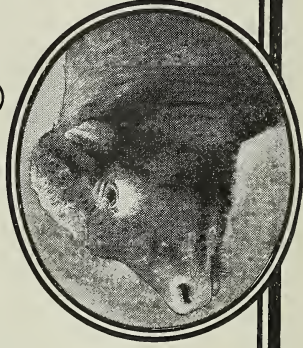
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An Apple Orchard in Bloom

THE AGRICULTURAL STUDENT

Vol. XVI.

OHIO STATE UNIVERSITY, COLUMBUS, MARCH, 1910

Number 6

The Study of Horticulture

By Prof. Wm. R. Lazenby

It needs no argument to show that the educational training required to make an able lawyer, or an efficient clergymen is not the same as that which is essential to the proper equipment of a farmer or an engineer. The routine of the classical course may do for the former, but it will fail to properly develop and equip the latter.

Great national crises demonstrated that the training, manual as well as mental, that is given by our national military and naval schools is just what is best calculated to fit a youth for eminence and renown as a military or naval commander. If this is true for the art of war, can it be any the less true for the peaceful arts and great industries of our time.

Shall rigid persistent manual training with implements of destruction count for so much and the choice and use of implements of production count for so little? No! We should train men for peace as well as for war! We should give our aspiring youth an opportunity to do better than their fathers in every field of blended intellectual and industrial effort, and show them in what direction further improvement is to be made. Among the more prominent arts and industries perhaps there is none that has superior advantages over horticulture. This art consists primarily in transforming by means of cultivation,

the crude and unused elements of earth and air into valuable food products, or living objects that minister to our aesthetic nature.

It is both an industrial and a fine art, readily separating itself into four great divisions, each of which may be many times subdivided.

These four divisions are:

I. Pomology or fruit culture, including the nursery.

II. Olericulture or vegetable gardening, including seed growing.

III. Floriculture — commercial and amateur.

IV. Landscape-horticulture, or the chief factor in landscape gardening.

In an address which I had the honor of delivering before the Society for Horticultural Science, I said, among other things, that no vocation was more conducive to physical and moral health than that of horticulture. But horticulture is more than a healthful vocation. Its intelligent and successful practice is based upon great principles which have been deduced from the natural and physical sciences. The horticulturist stands face to face with problems which require for their solution the amplest knowledge of nature's laws, the fullest command of science and the best efforts of the human intellect. In other words, horticulture is an intellectual pursuit and in its practice the strongest minds

may find scope for profitable employment.

Every useful vocation is respected in proportion to the measure of intellect and skill it requires and rewards..

Horticulture is esteemed by all and the reason is obvious.

It is in the realm of fine art where horticulture has the deepest and most abiding influence. There is a wealth of beauty in tree and shrub; in fruit and flower and leaf—a beauty which according to Emerson's averment, "is its own excuse for being."

When horticulture as a fine art arranges trees and shrubs, flowers and lawn, so as to present an expressive picture to the eye, the beauty is multiplied, and this development of the beautiful is the aim and object of all landscape-horticulture. Who can fully measure the effect of the horticulture of our parks and public grounds, or estimate its value in the external adornment of the home. We do well to make the interior of our dwellings beautiful; to decorate and adorn them with the products of the artist's skill; but we should not forget that the sense of beauty must be cultivated before we can appreciate the treasures of art and make them our own.

It is through horticulture that even childhood and youth may be trained to see the beautiful in nature. Through horticulture the blinded eyes may be opened, the dormant aesthetic powers awakened, and the heart made ready for a just appreciation of the glories of nature and the triumphs of art.

Perhaps enough has been said to prove the advantages of horticulture as a means of training. Its advantages as a vocation or life work could be shown quite as easily. In doing this the object is not to belittle or disparage any other legitimate method of training or

any other calling. Other vocations are useful, even necessary, and many follow them with advantage to themselves and to others.

The fact remains, however, that horticulture is the first and most essential of human pursuits, and the interests of all demand that it should be honored and prosperous. To pursue this vocation with satisfaction and profit boys and girls must be trained therein. To this end manual training departments in horticulture should be established and maintained in connection with our elementary, and high, schools. The small amount of land required and the necessary equipment in the way of tools, seeds, etc., would not be expensive. For winter, and to use during the inclement weather of other seasons, a glass structure in the external form of an economical commercial green house should be provided. The work undertaken in those training departments should embrace among other things the laying out of a model kitchen garden, a market garden, and small fruit plantations. It should include also, the cultivation of flowers, shrubs, and trees. In connection with the above the various operations of propagating plants by seeds, cuttings, layers, budding, grafting, pruning, transplanting, etc., should be thoroughly taught. The collection and planting of weeds, the breeding of the more common injurious insects; the use of insecticides and fungicides, the observation and study of our useful birds; the management of bees, and other similar subjects might form a part of the instruction and training. This is a training by horticulture, a training in horticulture, and a training for horticulture.

In addition to the tools of the shop, we urge the tools of the garden. The hammer and the saw should be supple-

mented by the hoe and the rake. The budding knife and the pruning shears, as well as the plane and chisel, should be used to educate the hand and eye.

We hear much in this day about reform in our system of education. In an age of free school and compulsory school attendance there should be more and better fruit gathered from the tree of knowledge. That is certainly a defective, if not a radically false system of education which leaves its subject no better qualified for any useful calling, with no more strength to wrestle with adversity, with no more power to maintain a healthful independence than though he were unlettered.

The great problem of educational reform is the proper blending of labor with study, so as to develop skill of body as well as vigorous activity of mind.

We need a system of education which recognizes the fact that men and women were placed on this earth that they may work, and that every attempt to escape this destiny should subject the offender to the logical penalty. A pupil so trained in our common and public schools should be able to nearly or quite work his way as a student through college or university, and would then go forth fully equipped to meet the responsibilities of life.

It is only through an education like this that the great masses of our people can ever attain the position and develop that self-respect which the genius of our age predicts and requires for them.

And although a beginning has been made, this education, for the most part, has yet its schools to modify and its teachers to train or discover.



A Young Apple Orchard, Showing How the Old Forest Is Being Replaced by the Young Fruit Trees

—Courtesy of W. W. Farmsworth

The Landscape Beautiful

Mr. Frank Albert Waugh, Professor of Landscape Gardening at the Agricultural College of Massachusetts, has recently issued a timely and epoch-making book on landscape art. It is published by the well-known firm of Orange Judd Company, New York, and is entitled "The Landscape Beautiful." The text is illustrated by fifty full-page halftones of landscape glimpses in parks, fields, and forests, but lovely and dreamy as these many engravings are, it is the text of the book that charms, interests and enthuses. A short review of the book would not do it justice. We will therefore let the writer speak for himself through a few excerpts culled at random:

"That charming essayist who wrote a lecture on the relation of literature to life did not hesitate to claim everything for literature. He made it his thesis that literature is really the whole stream of life so far as thoughts and passions of mankind have any continuity through the generations. It would be too much to say of landscape that it is the whole life, but this is true at least, that life, as we know it, could not exist apart from the landscape.

"Human life has a few fundamentally necessary conditions, such as food, speech, a social organization, a certain conception of the Infinite power, and a ready contact with the material world. I have not put literature in this category. This may look like taking the negative against Charles Dudley Warner's proposition; but, in the first place, the foregoing list is not intended to be a complete one; and, in the second place, I am not convinced that literature is really one of the conditions of life. It seems to me to be rather one of its pro-

ducts. Landscape, however, is one of the fundamental conditions.

"Is there an American style of landscape gardening? or will there ever be one? These questions can not be answered categorically and with confidence. If we have not yet developed a national style in music, painting, literature, or architecture, it is quite too much to expect that greater progress should have been made in landscape-gardening. Some things have, indeed, been done in truly American way. We have the park systems of Chicago and of Hartford; we have many magnificent private estates, and we have had the exposition at Buffalo. These are only typical examples, showing the art of landscape architecture in a fairly American form. At least we are no longer dependent on exotic plans, plants, nor gardeners. With just pride we may label the whole thing 'Made in America.'

"The uninitiated person hearing of masterpieces easily forms the idea that there is something complete and final about each one. The very word, 'masterpiece' has a big, sonorous and conclusive sound. However, when the critic comes to close quarters with any of the renowned works he finds that they are not without defects. Even the most masterful of the masterpieces, in literature, music, or painting, is only a little way in advance of its competitors. Or, to say differently, there is no such thing as perfection or finality in the works of human art.

"In the field of landscape architecture there are special difficulties which

have already been hinted at. A piece of work may be left today in the very best condition which the landscape architect's skill can give it, and yet five years from today, through neglect or abuse it may be worthless. An artistic effect in landscape-gardening will not stay fixed. The long time required to secure results in the best sort of landscape work also brings difficulties. The situation becomes particularly awkward when, through the lapse of time, several landscape-gardeners are employed successively on the same piece of work.

“Some of the masterpieces which I have included in my list are important on account of their historical significance. Circumstances have conspired to give them special influence. This is the case, for instance, with Central Park, New York. The park itself is by no means the best one in the country, and the original design is by no means the best work of its author. Nevertheless, the making of Central Park marks an epoch in American landscape architecture. It was the beginning of the great city park systems which today supply the most magnificent examples of the value and beauty to be achieved in the successful practice of this art.

“Number Two. The World's Fair grounds at Chicago in 1893 presented a picture which America will never forget. This was probably the most influential piece of landscape architecture ever developed on this continent. In spite of its short life, it was viewed by hundreds of thousands of people from all parts of the continent, and these were precisely the people most able to bear the influence of such work into their own communities. Besides all that, the country was ready for an ar-

tistic awakening. America was thoroughly sick of the disgusting architecture which had prevailed since the Civil war. The country had been undergoing an era of despondency, bordering on insanity, in every form of practical art. Home furnishings, men's and women's dress, and every other form of every-day art had sunk to the lowest possible level. The country was beginning to accumulate wealth and needed only a new leadership in matters of taste. Under such circumstances, the architecture and gardening of the World's Fair grounds proved a revelation to thousands of persons. These men and women went home inspired with new ideas of beautiful things and with a determination to make their own home towns and cities something of the grandeur and magnificence of the White City beside Lake Michigan.

“The design in itself was a good one. It was well adapted to the flat land on which it was built. It was convenient for the purposes of the Exposition. It showed what could be done in the massing and harmonization of architecture. It showed how this could be accomplished in such a large way as to amount to landscape making. The great Court of Honor, surrounded by its beautiful white buildings, with Macmonnies' fountain at one end and the statue of the Republic at the other, told thousands of people for the first time in their lives what were the possibilities of the architectural style of landscape art.

“Presently the visitor crossed a beautiful arched bridge at one side. Probably the visitor had never seen a beautiful bridge before, having known only the most vulgar iron truss work or the shabbiest wooden bridges. At the other end of the bridge he found himself in a pleasant wild garden. The path ran

through shady trees, it followed the rusty border of the lagoons, it hid behind masses of shrubbery, it took him by a few steps quite out of sight of the gorgeous White City. He understood with wonder that this wooded island, with all its trees and shrubs and its encircling lagoon, had all been lately made; and he felt that this, indeed, was landscape-gardening. Thus the two great styles of landscape architecture were most emphatically impressed upon the knowledge of the American people at the precise moment when they were most ready to respond. Works of greater artistic merit will often be produced hereafter in America, but works of greater influence never.

“Number Ten. One of the most characteristic developments of landscape architecture in American during the last decade has been that of city building. Suddenly it has come to be recognized that a city is not a fortuitous aggregation of ugly objects, noisome smells and unpleasant noises. It may just as well be an orderly arrangement of things which are beautiful in themselves and capable of still greater beauty when harmoniously arranged. Many enterprises in city improvement are now under way, and one or two of them should be mentioned amongst American masterpieces in spite of the fact that no one of them has as yet reached completion.

“Unquestionably, Washington stands as the best of our American cities in point of design. This is largely due to the fact that it was designed at the start, instead of being allowed to grow. The work of L’Enfant was so well conceived in the first place, and so well established at the beginning, that it has been proof against meddling or neglect.

The city of Washington has always been rather fortunate in all matters connected with its general design. Good architects have been employed on the public buildings (with a few exceptions), and good landscape architects have given what help they could on public ground. Andrew Jackson Downing in his day did good work in Washington, and the White House grounds have never been debauched by bad and expensive gardening.

“It is well known that much of the money spent on road improvement in the country is wasted. This is partly because of neighborhood jealousies and cross-road grafts, but largely through plain, honest ignorance. It is hardly to be expected that every road overseer in a country town will be a graduate engineer with up-to-date knowledge of Macadam, Telford, and Tarvia. Those states, therefore, will have county road overseers, or state highway commissions with good engineers at public service, are in the position to get the best roads. Every effort ought to be made to place the services of these experts within reach of the country neighborhoods where road appropriations, always pitifully small, most need to be economized. Country roads ought to be better built, and any scheme which will build them better is to be encouraged.

“Very many country roads not only need to be rebuilt, but they ought to be entirely relocated. Present locations were usually determined many years ago, at the time when the country was first settled. Commonly roads were placed along farm boundaries, not because that was the best location, but because it was customary, and at the time it made little difference. There is probably not a town in New York State or New England in which considerable

portions of the main roads could not be relocated to advantage. Any intelligent man could sit down with a map of the town spread on the table and do it after supper. More direct routes could be found between important points, steep hills avoided, swamps and sandy stretches left to one side. In most places there is absolutely nothing left to interfere with such radical and far-reaching improvements. Land is cheap, and condemnation proceedings are easy. In many instances the owners would be glad to give the land.

"Thus far I have spoken chiefly of the North Atlantic states, where land is hilly and roads crooked. The complacent dwellers on the flat interior plains, with their checker-board section-line highways, often imagine that their system is beyond improvement. This is where they are worse off than the New Englander, who knows that his roads are imperfect. The most thoroughly inconvenient system possible is the rectangular layout, whether applied to cities or to farming districts. City builders have learned this and are trying to bring city plans more to the style of Washington and Paris.

"It would be a very great practical benefit to McPherson, Kan., for example, if a good public thoroughfare could be established running fifteen miles directly northwest from town. If, then, with slight deviations to avoid rough

land, it could be continued straight to the village of Marquette, so much the better. A similar diagonal road could be run to the southeast of the city, another to the northeast, and another to the southwest, with equally good effect. For twenty years I lived four miles north and four miles west of McPherson. We called it eight miles to town and traveled the distance without complaint three times a week. As a matter of fact, we were less than six miles from town as the bee flies and were wasting five miles of hard work every trip. I figure that at five miles a trip, three trips weekly, for twenty years I traveled over fifteen thousand highly unnecessary miles, and the thought of it disgusts me so I would like to go back now and sue the county for damages.

"Just consider that there are one hundred busy, hard-working people to-day in that same neighborhood, going to McPherson, say, twice a week the year around. There are twelve thousand miles of travel wasted every year by just those few men and women of that neighborhood. Was such economic waste ever tolerated in anything else? Yet there are thousands of cities and towns in Kansas, Nebraska, the Dakotas, Iowa, Missouri and adjoining states where no diagonal highways exist or were ever thought of. Surely rural improvement finds it easy to propose something better."



The Outlook in Horticulture in Ohio

By Prof. Price

The eastern states are just beginning to awaken to their possibilities for horticultural development. The increase in population, the increase in value of farm real estate and the higher cost of production are making it necessary for the Ohio farmer to readjust his system of farming and to adopt more intensive methods. Horticulture stands foremost as an intensive system of farming which can be carried to any degree desirable up to the point of covering the land with glass and providing artificial heat and farming the land winter and summer by means of greenhouses.

The divisions of horticulture are sharply defined and each has its distinct field and for each division there is increasingly promising opportunities in Ohio. The orchardists are usually the first class thought of when horticulture is mentioned, and the orchard interests probably are by far the most important and occupy the most land and the most people at the present time. Commercial orcharding is doubtless returning the largest net returns per acre to the successful growers at the present time of any system of farming being practiced. With a population of between four and five million people within the state and the best of facilities for shipping out of the state, the market for good orchard fruit is practically unlimited for the Ohio fruit grower, with the prevailing high prices of orchard fruits during the past few years, the consumption of orchard fruits has been reduced to one-half of what it might be and what it ought to be. With apples retailing in the city markets throughout the winter at as high or higher prices than oranges, the consumer is forced to curtail his

purchases and remember with regret how the apples used to lie on the ground and rot when he was a boy on the farm, because no one would buy them at any price. But what is the danger of this being overdone? If orcharding is so profitable people will rush into it and in a few years the supply will so exceed the demand that there will be no market for the product. But right there is the mistake. It is possible that many will rush into orcharding, but a great many of them will do it without realizing that the successful orchardist must be a specialist, that he must be prepared for his work and that it is increasingly difficult to grow good fruit. With the increasing multitude of insect and fungus enemies to destroy the trees and the fruit, it is safe to count upon at least fifty per cent. of the orchards never coming into profitable bearing. The man who is contemplating planting orchards need have no fear of a market for good fruit in the future.

Enthused by the glowing account of promoters of fruit lands in other states, the prospective orchardist naturally asks is it worth while to plant orchards in Ohio? Why not go to sections that are more favorable and where a man will get more returns for his labor? Where shall he go and what state offers better opportunities for the commercial orchardist than Ohio does at the present time? But the orchards are producing results and will produce results that will compare favorably with results that may be secured any place in the country. The prospective orchardist has the advantage of not being forced to pay fictitious prices for land before it is planted to orchards simply because



Harvesting Potatoes, One of Ohio's Great Products

some promoters have advertised it extensively.

Next to orcharding comes truck farming and this class of farming naturally develops in the vicinity of cities and with the large number of growing cities that are found in Ohio the market for the truck farmer is an ever widening one. With the trans-continental lines passing through Ohio the eastern markets become accessible and give an outlet for the surplus products of truck farms. What has been said of truck farming applies to the florist and the gardener that grows vegetables under glass. The accumulation of wealth in the cities gives a rapidly growing market for this class of products.

Probably the most sharply defined division of horticulture is landscape gardening. While the other lines of horticulture are producing industries that

are creating wealth, landscape gardening only contributes to our appreciation of the beautiful. It is naturally a development of civilization; as the country grows older, as wealth accumulates, as the cities grow, the demand for the landscape gardener increases. His services are demanded by the cities for laying out the parks, for planning the civic improvements. The schools and corporations call for his services, the more progressive of the manufacturers furnish employment for him.

The outlook for horticulture in Ohio is one of expansion in every line. The natural drift of the more intensified is toward horticulture and dairying. Economic changes are taking place. The systems of farming are rapidly changing and the more intensive forms are rapidly coming.

To the Lovers of Our Home Apples

If we stop and size up the conditions of our farm orchards in most of the states we will see that they are rapidly passing out of existence. And we hear on every hand that we do not have the good apples that our forefathers grew. Why is this?

Man has in a way upset the natural conditions that existed before the bulk of our forests were cut and before cultivation was so extensive.

This has brought new conditions and enemies of the orchard, which were unknown to our fathers. It is true that some enemies have been introduced from other countries, such as the San Jose scale. The fact that so many introduced insects are injurious here and not in their native countries is due to the fact that they have been introduced without their natural enemies. It is true that man can introduce those natural enemies, and the U. S. Department of Agriculture have had some very good results from this method. But such work is slow, and for immediate results to control the insects and fungi pest of the orchard we must rely upon artificial means.

After having grown the trees—and is it not true that with the ordinary care in the way of cultivating, fertilizing and pruning, that we can grow the trees just as well as our fathers did?—to produce the “good fruit” we must use artificial methods to fight the insects and fungus diseases. Spraying is the most important of these methods and only in a very few localities can good fruit be grown without spraying.

There are a few insects that may injure the tree directly and, if not taken into camp, will result in the death of the tree. Of these the San Jose scale is like-

ly the most important and widely distributed. But it can be controlled by spraying the trees once or twice each year—during the late fall, winter; or early spring, when the trees are dormant.

The spray used should be applied thoroughly and cover the entire surface of the two. We have two types of spray material—the lime and sulphur solution and the missible oil. These can be obtained on the market from a number of different manufacturing chemical houses. Lime and sulphur solution can be made at home by boiling 15 pounds of “lump lime” with 15 pounds of “Flour of Sulphur” in about 10 to 15 gallons of water. Boil for at least an hour. Boil it, don’t just heat. Then strain through a fine sieve and add enough water to make 50 gallons of spray, and apply to the trees with a good spray pump of which there are a number of good makes to be had. A barrel outfit for an average size farm orchard can be bought complete for from \$15 to \$25.

To control the insects and diseases which are respectively the most injurious to our apple crop, codling moth (an insect), apple scab and bitter rot (fungus diseases), it will require about three to four sprayings.

If it is necessary to spray your orchard with lime and sulphur solution as given above for the San Jose scale, and you are sure you can cover the orchard, put off spraying till just before the buds open in the early spring and this will answer the purpose of the first spraying of the Bordeaux mixture, which it is necessary to give the trees to control the apple scab, if present. The second spray in the apple orchard is if the

same Bordeaux mixture plus 3 to 3½ lbs. of arsenate of lead, which is a stomach poison, to control the codling moth. This spray must be applied at the time when the blossoms are just about to fall from the trees. Do not wait until they have all fallen, for it may then be a little too late to poison the largest number of codling moth larvae. The third spraying is of Bordeaux mixture alone and should be given the orchard in about two weeks after the second. To grow good apples without at least these three sprayings is the exception and not the rule in most localities, and in some sections a fourth spraying of the combined Bordeaux and arsenate of lead is necessary to control the second brood of codling moth.

“Never spray in the dark.” Write your State Experiment Station for spray bulletins and read them. Know what you are spraying for; that is, that which you are trying to control. Find out the time your efforts will be the most effective, and then do a thorough job.

You ask what will it cost me to spray my farm orchard. Information from your Experiment Station will cost you but a little time. And to spray as given above an average size tree, 25 years old, it will cost you for labor and materials about 50 cents a tree. Is this too much insurance to put upon your apple crop? Think it over and try and have your own good home-grown apples for winter use, and it will be likely you'll have some apples to sell, too.



Delicious Strawberries for the Gathering

—Courtesy of W. W. Farmsworth

Bees and Fruit

By E. R. Root

A few years ago there was an antagonism between the fruit-grower and the bee-keeper; but I am happy to observe that this has almost entirely disappeared, because both sides recognize that nature, apparently, has designed that the two should work in harmony; and it therefore follows to a greater or less extent that the one is dependent somewhat on the other. The statement was also made that bees would cut into ripe or sound fruit; but the facts of recent years have practically disproved this. In two or three cases, where the matter has been referred to the courts, the bees have been declared not guilty. The most celebrated case of the kind was that of *Utter vs. Utter* that took place at Amity, N. Y. The jury was unanimous to the effect that bees do not puncture sound fruit.

Bees have sometimes been accused of puncturing grapes; but careful examination shows that small birds with a sharp beak, conspicuously the Cape May warbler and the Baltimore oriole, will pierce the grapes early in the morning before anybody is up. The small, sharp, needle-like holes left in the berries are visited by the bees during the day, during which they suck out all the pulp, leaving nothing but the shriveled skins. Thus it is that the bees get the credit for doing mischief that the birds have actually made possible. For information on this subject refer to Dr. Merriam, of the United States Department of Agriculture, Washington, D. C.

But it must not be denied that they will visit broken or partially decayed fruits. They will hover over that during a scarcity of nectar, sucking out the juices and leaving only the mere shell

of the fruit. Some fruits of this kind have a market value; and when the bees help themselves to them in a wholesale way, as they do sometimes, there is no dodging the fact that a damage has been done. In that case the owner of the bees should reimburse the fruit-grower; but a little intelligent management on the part of the bee-keeper will avoid any trouble of this kind. When there is a dearth of honey the bees may be fed near the hives by giving them access to thin sugar syrup. Means must be provided so that they will not be able to get this food too rapidly. While thus kept busily engaged taking the syrup they will not touch any broken fruit. Where peaches and pears are exposed in baskets, the owner of such fruit should see to it that they are covered with mosquito-netting. Neglect to comply with this very obvious remedy should not entitle him to any damages from the bee-keeper.

Again, in years gone by it was complained that the fruit-growers sprayed their trees while in bloom. I am happy also to observe that this practice has almost gone entirely out of vogue, for experiment stations everywhere have shown that as good and better results can be secured by spraying before and after bloom. To administer the poison while the trees are in full flower is a damage to the fruit-grower and to the bee-keeper alike—to the first mentioned, because some of the delicate parts of the blossoms are injured, killing the embryo fruit; to the bee-keeper, because the bees will be poisoned in countless thousands. There is only one manufacturer now, I believe, who recommends spraying while the trees are in

bloom, notwithstanding the experiment stations of Ithaca, N. Y.; of Wooster, O.; Fort Collins, Colo., and elsewhere, have issued bulletins strongly condemning the practice from the standpoint of the fruit-grower.

But the charge has been made that the bees have been the means of scattering pear-blight in the regions where pears are grown largely, notably in central California. In 1901 considerable trouble arose between the pear-growers and the bee-keepers of Kings Co., California. The feeling became very bitter between the two factions. There was talk of resorting to the courts. The question arose whether or not bee-keepers could be ejected from the territory. As President of the National Bee-Keepers' Association I was called on to look into the matter and make such recommendations to the bee-keepers as might seem advisable after consulting with the fruit-men. I found that Professor Waite of the United States Department of Agriculture had given out the statement that bees might, and probably did, spread pear-blight in the vicinity. Authority from so high a source complicated the problem of the bee-keeper. After looking over the field and talking with the fruit-men, whom I found to be reasonable and gentlemanly in every respect, I recommended that the bee-keepers remove their bees from the vicinity as a test experiment. This was done; but the pear-blight seemed to spread just as rapidly as before. When present on the ground I discovered that young pear-trees that had never blossomed, and which, of course, the bees had never visited, were as badly blighted as the old trees. It also developed that there were countless myriads of insects of every sort, especially ants, that were going from the old trees to the young ones. It also developed that there were

certain wild bees over which man had no control, and that the removal of the tame ones did not in any way, apparently mitigate the ravages of the blight.

To make a long story short, the bee-keepers and the pear-growers are living together in harmony today. If the bees help to spread the blight, as undoubtedly they do at times, the removal of those under the control of man does not seem to mitigate the trouble. On the other hand, the pear-men seem to recognize that the bees perform a most invaluable service in a cross-fertilization of the blossoms. In a paper read by Professor H. A. Surface, Entomologist of the Agricultural Department, of Harrisburg, Pa., he made the statement:

"I wish to establish the thesis that pear-blight often appears without the intervention of bees; and that as these are not by any means the sole agents capable of the dissemination of such germs, the pear-growers are not justified in condemning the bee and desiring to exclude it from our orchards."

But perhaps on the question of whether bees do more good than harm in pear-orchards where blight is more or less prevalent, there may not be a unanimity of feeling on the part of my auditors. We bee-keepers are certainly open to conviction, and not desirous of relieving the bees of any responsibility or blame that they deserve justly.

Now, the question arises. Do bees perform a valuable service to the fruit-grower in cross-pollenating fruit-trees? I believe I am safe in saying that it will be generally admitted that they do perform some service; but as to how much, that would be a question. On this point an immense amount of data has been offered by scientific and practical men. I regret that my time is such that I shall not be able to present all the data at

my command, but I will here present for your consideration some data, not only from bee-keepers but from FRUIT GROWERS and experiment stations alike. I have made no effort to classify them, and will simply present them as I was able to gather them, taken from a great variety of sources.

Prof. A. J. Cook, Professor of Entomology, in 1891, at Michigan Agricultural College, says:

"I tried many experiments last spring. I counted the blossoms on each of two branches, or plants, of apple, cherry, pear, strawberry, raspberry, and clover. One of these in case of each fruit, or each experiment, was surrounded by cheese-cloth, just before the blossoms opened, and kept covered till the blossoms fell off. The apple, pear, and cherry were covered May 4th, and uncovered May 25th and May 19th. The number of blossoms considered varied from 32, the smallest number, to 399, the largest. The trees were examined June the 11th to see what number of the fruit had set. The per cent. of blossoms which developed on the covered trees was a little over 2, while almost 20 per cent. of the uncovered blossoms had developed."

J. J. Gilliland, who, in the summer of 1893, in a large field of medium red clover that came within thirty feet of his door, covered some blossoms with netting, and around others, NOT covered, he tied a small thread. During the following August he gathered seed from the covered blossoms, and also some from the plants not covered; and by carefully counting the seeds he found that the latter gave 21 per cent. more seed. His experiments were repeated again with like results.

C. J. Berry, one whose fruit-orchard contains 440 acres, and who is Horti-

cultural Commissioner for Tulare Co., Cal., an inland county that has made great progress in the fruit industry, gives this valuable testimony:

"Bees and fruit go together. I can't raise fruit without bees. Yes, sir'e. I have bees all about my big orchard. Two years in succession I have put netting over some limbs of trees; and, while they blossomed all right, nary fruit; while on the same tree, where limbs were exposed to the aid of bees, plenty of fruit."

Mr. F. A. Merritt, of Andrew, Ia., testifies as follows:

"Our apple orchard is situated in such a way that it is exposed to both the north and south winds. About four years ago, as the trees on the south row (Transcendants, that throws out a heavy growth of foliage at the same time it blooms) began to open their bloom, a heavy south wind prevailed for about five days. I noticed, during this period, that the bees could not touch the bloom on the south side of the trees, but worked merrily on the more sheltered limbs of the north side. What was the result? Those limbs on the north side were well loaded with fruit, while on the south side there was almost none to be seen."

Mr. J. F. Becker, of Morgansville, N. J., had eight greenhouses where he grows cucumbers, and, attached to each one of which, with an entrance on the inside as well as outside, he has two colonies of bees. He found that, without them, he could not successfully fertilize the blossoms of the vines, and consequently could get no cucumbers. With them he is entirely successful in growing the finest of cucumbers for the early market, where he gets fancy prices.

One of the government bulletins, by

Frank Benton, for 1894, commenting on the agency of the bees in the fertilization of fruit-blossoms, says:

"The facts they have brought forward are gradually becoming more widely known among fruit-growers and bee-keepers, and additional evidence accumulates. A case illustrating very clearly the value of bees in an orchard has recently come to the notice of the writer. For several years the cherry crop of Vaca valley, in Solano Co., Cal., has not been good, although it was formerly quite sure. The partial or complete failures have been attributed to north winds, chilling rains, and similar climatic conditions; but in the minds of Messrs. Bassford, of Cherry Glen, these causes did not sufficiently account for all the causes of failure. * * * To test the matter they placed, therefore, several hives of bees in their orchard in 1890. The result was striking, for the Bassford orchard bore a good crop of cherries, while other orchardists in the valley who had no bees found their crops entire or partial failures."

Prof. Bailey, the very able horticulturist of Cornell University, writes: "Bees are much more efficient agents of pollination than wind, in our fruits, and their absence is always deleterious."

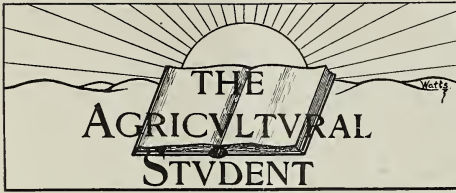
At a joint meeting of the National Bee-keepers' Association and the National Pomological Society, occurring on Sept. 12, at Buffalo, H. W. Collinwood, editor of the Rural New Yorker,

one of the best and most reliable agricultural papers, said:

"We can easily forgive the bee his short working days when we consider the good he does. There is no question about the debt fruit-growers owe him. People talk about the wind and other insects in fertilizing our flowers; but I am confident that any man who will really take time and pains to investigate for himself will see that the bee is nearly the whole story. I have seen the certain results of his good work in a neighbor's orchard. Those bees "broke the trees" down just as truly as though they had climbed on the trees by the million and pulled at them. The appearance of those trees after a few years of bee-keeping would have convinced any fair-minded man that our little buzzing friends are true partners of the fruit-grower."

In addition to all this I may state that there has been a demand of late on the part of a large number of extensive fruit-growers of Wisconsin, Michigan, New York, and Pennsylvania, asking bee-keepers to locate a few colonies in orchards near which there have been no bees. Indeed, the fruit-growers have offered to furnish the space and the buildings necessary to accommodate the bees and appliances, free of charge to the bee-keepers. I may say that the latter have but to avail themselves of the opportunity, for honey from fruit-blossoms is some of the very finest ever produced, and the fruit-grower profits immensely in his turn.





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COLUMBUS, O., MARCH 15, 1910.

EDITORIAL

It is time once more for the present Editor, Business Manager and some of their associates to tender into the hands of a new board the reins of "The Student's" administration. Beginning with the April issue The Student will be edited by the new staff, so that early in the game they will become acquainted with the needs and demands of their new task. The new staff elected at a meeting of the Agricultural Society on March 2nd are: Mr. Howard McCall, Editor-in-Chief, and Mr. Earle R. Hurst, Business Manager.

After being intimately connected with "The Student" for several years we step down and out reluctantly, but willingly. Reluctantly, because we have made many substantial plans and built many ideals for the betterment of "The Student" which have not as yet crystalized, but which we hoped would develop during our tenure of office. In reviewing our past efforts we see many errors and many lost opportunities by which we could profit, and even now would like to develop some of our fond ideals. Willingly, because we are optimistic of the future. We know that the incoming staff will develop desirable plans, institute new improvements, and profiting by errors and mistakes, develop a journal of which we all will be proud. There will be ups and downs in this as in every activity of life. There will be new revelations presented, new opportunities to grasp, new obstacles to surmount. And in handing over the editorial quill, there goes with it our sincerest wishes for a prosperous and high type of journalism.

Now let this one fact be grasped and fully appreciated, not only by the new staff, but also by each and every student in the Agricultural College: That the maintenance of The Student, its success, and the fulfilling of its mission and purpose is your responsibility, and its welfare is entitled to his every effort. Agriculturally, Ohio is one of the greatest states in the Union. Nevertheless, on many of her farms production falls far below the average. Intelligent co-operation among the Agriculturists is the need of the present day. Along these lines the vast opportunities of the College are just being recognized. And the part that The Student will play in this great movement depends upon the conscientious and unselfish work of those whom this paper represents—the

students of the Agricultural College. Let this work be generously given and the reward will be as generously apportioned.

FAREWELL TO "SHORT AGS."

With the coming of spring, when the trees begin to bud and the birds to mate, we lose one of the most interesting characters of the Agricultural College—the ten weeks' students—or, as he is more familiarly termed, "the Short Horn." While termed this, perhaps, in derision, let us state that the short ag. student, like his namesake, may be regarded as the savior of the farm. No better, no purer blood lines can be found than the Short Horn. Coming from a homely but honest lineage, the Short Horn has developed into the leader of all breeds, just as we hope our "Short Horns" will develop into leaders of men. The four-year student is all right, but how many of them return to the farm and actually benefit their community? Of the last 180 graduates of our College of Agriculture, 80 have returned to the farm. All the Short Course men return to the farm and there put into actual practice what they have learned during their brief sojourn with us.

So, Short Horns, we extend to you a most hearty farewell and bid you welcome, you and your neighbors, to our institution next winter.

BROOMHALL'S HIGH PRICE THEORY.

Geo. Broomhall, the well known British statistician and authority of food stuff values, in a recent number of *Corn Trade News* discusses the reason for the present high prices of farm products. After considering the affect of increased gold production on prices, the following theory is formulated:

"Thirty years ago there was a strong impulse shown in England and America towards agricultural improvement, the invention of many labor-saving machines took place and the forces of production and the methods of transport were intensified and perfected. In a civilized society population generally increases faster than agricultural skill, and food consequently tends to become dearer. During the period when these labor-devices were first coming into use, and for some years subsequently production suddenly leaped ahead and left population behind. But the law that ordains that population always tends to increase faster than its means of subsistence was not abrogated, but merely suspended for a while. In a short while population, unrestricted by the pressure of dear food, increased abnormally fast, as witness the census returns of the United Kingdom, United States, Germany, Italy and Austria-Hungary during the concluding two decades of the nineteenth century. In the past twenty years we cannot think of any notable labor-saving agricultural machinery having been invented, at any rate none of the like importance to those introduced in the sixties and seventies. Population now is again pressing hard upon the means of subsistence in every country of the world, hence the higher and rising range of price."

SHE MEANT WELL.

The young son of a Western family was away from home for his first year in college. His mother had been to visit him, and upon her return met a friend, who asked if her boy was homesick.

"No," said the doting mother. "I was afraid he would be, so I saw that he was located in one of the best maternity houses of the college."—March Lippincott's.



NEWS NOTES



An experiment conducted by the Farm Economics Department with different methods of seeding of alfalfa has just been completed. This experiment was begun in 1908. Three plots were used, similar in condition of soil. The first plot was seeded to alfalfa on April 17 and 18 with one and one-half bushels as the nurse crop. The second plot was left fallow, and seeded to alfalfa on July 17 and 18. The third plot was seeded on August 6 and 7 after harvesting a crop of early potatoes. The record of the seeding, etc., in each case, was kept. The first plot lacked \$2.28 per acre of paying expenses of seeding, while the second plot lacked \$10.48 per acre of paying seeding expense. On the third plot there was a net profit of \$21.83 per acre after paying seeding expenses.

In 1909 there were three cuttings of hay taken from each plot. The first plot yielded 8,584 pounds per acre, the second 10,572 per acre, and the third 11,536. A similar experiment conducted at Wooster gave like results. On these same plots experiments with fertilizers were conducted. Each plot was divided up into three parts. On one part acid phosphate was applied at the rate of 200 pounds per acre, on the second acid phosphate containing 5 per cent. of potash was applied at the same rate, and the third part was used as a check, no fertilizer being applied. Varying conditions during the time in which these experiments were conducted made the results of the experiments inconclusive.

Experiments with corn in the south field. There were two plots, one of which was manured in the spring of

1908, and the other left unmanured. In the fall of the same year, lime was applied to one-half of each plot, the other half in each case being left as a check. It was found that in each case the lime decreased the yield of corn. No satisfactory explanation of this has as yet been offered, though it is suggested that it is simply a case of applying lime when lime is not needed.

On March 7th a two-weeks' special course in ice cream making was begun in the Dairy Department. Seventeen students are enrolled. H. Meyer, of the "Busy Bee," has been selected as the special instructor. This is a new departure from the regular routine, and from indications it will be a successful one. It is to be hoped that other courses of a similar practical nature will follow.

Prof. Hill, of Chicago University, and director of the Agricultural Guild, was in the city to visit the university, but while here conferred with the members of the Agricultural faculty and students in the College of Agriculture in regard to the work of the Agricultural Guild.

The Extension School held at Miamisburg the first week in March was quite a successful one, though the attendance was not as large as that at other schools. Animal Husbandry, Soil Fertility and Farm Crops were the subjects taught.

The week beginning the 14th, two schools will be held, one at Zanesville, and another at Wauseon. At these, Dairying will be the main subject, though Farm Crops and Soil Fertility will be included.

A bill has been introduced in the General Assembly by Judge Dever to promote the interests of Forestry in the state of Ohio. This bill authorizes the trustees of the state university to purchase delinquent or forfeited lands as they deem suitable for forest reservation, and to manage such lands, so as to demonstrate rational methods of forestry. These forest reservations are to be used as demonstrating grounds for the education and training of young men in the science of forestry.

The regular plan of the program of the winter course lectures was diverted to include three lectures, one by Mr. H. C. Rogers on Forestry, the other two by Mr. W. W. Farnsworth on Commercial Orchardling. These lectures were both interesting and practical.

A bill to provide for correspondence courses in Agriculture Colleges has been introduced in the Senate by Senator Williams, of Jackson. This bill was introduced at the suggestion of the Food Probe Committee.

A milk testing association was organized under the direction of Prof. Erf, Tuesday, March 8th, at Orrville, Ashtabula County.

Prof. Erf was in Moscow on the 12th, attending a dairy meeting.

MEAT CUTTING DEMONSTRATION

There was quite a large attendance of both students and visitors at the meat cutting demonstration given under the direction of Professor Plumb on the afternoon of March 9th. Before actual proceedings took place, Prof. Plumb gave a short talk on the Real Situation in the Meat Question.

The population of the human race has

been increasing, while the number of the domesticated animals has been correspondingly decreasing during the past decade or more. There has been quite a decided reduction in the size of herds and flocks in the United States and Europe, Argentine alone being the only country where there has been any increase. In the United States the production of swine has dropped off 3,000,000, while in Ohio there was just this last year a shortage of one-third of a million. Is it any wonder, then, with this increasing population and decreasing production that prices should rise. The alarm is greater than the existing conditions actually justify.

The different cuts of both the sheep and steer were then pointed out on the live animal by the Professor and the quality of the meat as indicated by the condition of the live animal commented upon. Then, by the aid of a skilful butcher, Prof. Plumb showed the same cuts upon the dead carcass. Their relation and quality were skilfully brought before the audience not only by explanation, but also by example, for some of the cuts were passed around, and how tempting they did look! The cooking side of the meat question was handled in an interesting and instructive way by Miss White, of the Domestic Science Department.

SHORT AG. BANQUET.

The annual banquet of the Winter Course students Thursday evening at Beggs' was a great success. Professor William R. Lazenby, of the Department of Forestry, acted as toastmaster and Dean H. C. Price spoke first on the "Winter Course Students." "The Winter Course man is the most zealous student of them all," he said. "He knows just what he is at college for, and he does it." He was followed in

order by Professor C. S. Plumb, of the Animal Husbandry Department, on "The Short Ag—A True Type;" Professor A. G. McCall of the Department of Agronomy on "Back to the Farm;" Professor F. R. Marshall, of the Animal Husbandry Department, on "Balanced Rations;" Professor O. C. Cunningham, of the Dairying Department, on "The Milky Whey;" Professor H. C. Ramsower, of the Agronomy Department, on "The Windmill;" Hon. W. H. Phipps, "A Clodhopper at College;" Mr. Charles Palmer, "The Curtail;" Professor L. M. Montgomery, of the Horticultural Department, on "The Apple of My Eye;" Mr. F. B. Winters, a Winter Course student, on "The Country Gentleman;" Director C. E. Thorne, of the Ohio Experiment Station, who spoke instead of Dean D. S. White, of the Veterinary College; Professor W. S. Clevenger, of the Dairying Department, on "Buttercups;" Mr. Frank Cleveland, President of the Short Ag Lietrary Society, on "The Turnpike." The program was concluded with a somewhat longer address by Hon. A. P. Sandles, Secretary of the State Board of Agriculture, on "The Country Bunco." He spoke mainly of what the Winter Course man can do for his community after he goes back home.

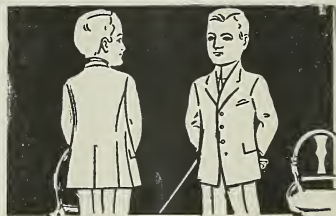
The Winter Course in Agriculture will close Friday, March 18.

There is more than enough wealth in the state of Texas to support all the human beings on this earth. You might multiply the population of the earth by ten thousand, and science, administered unselfishly for the benefit of all, would give ALL enough and more than enough. There is no reason why any man should be overworked, or tired, or anxious, or discouraged.

There is no good reason why any child should be deprived of a chance in life by being worked in its childhood. There is no excuse for any woman to suffer because her child lacks those things that would save it.—Arthur Brisbane.

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 Assumes when in his presence a manner that is coy;
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 And clasps her closely to him and gladly holds her fast,
 And as he bends to kiss her and she serenely sighs
 This fact is demonstrated: It pays to advertise.

—Chicago Record Herald.

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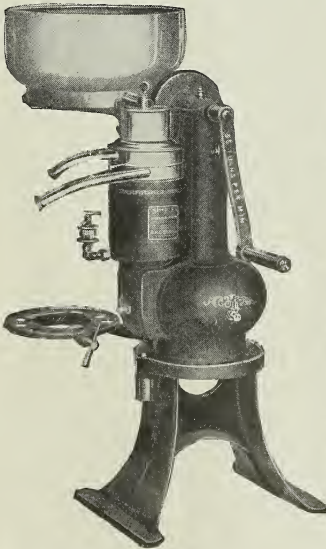
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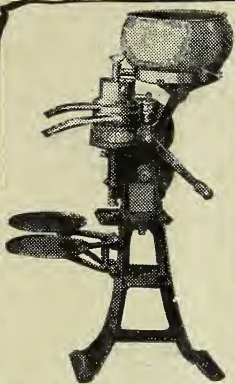
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